KMIP Interoperability Testing – Formal Process

January-February 2013

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Cryptsoft

Overview

- Objective: to obtain a verifiable expression of KMIP support and conformance for each participating implementation
- Achieved through:
  - Vendor claim statements
  - Cross vendor claim testing
  - Vendor testing verification
- Delivers: an inarguable set of test results clearly indicating each implementation's behaviour

Process

1. Publication and agreement of the formal process including testing scope
2. Capability claims – completed by each participant for each implementation
3. Claim collation – collection of claims, targeted tests produced & distributed
4. Testing – Each participating client tests against each participating server
5. Verification – Tests are verified
6. Dispute resolution and results publication

Capability Claims

- Vendors complete claim sheets for each particiating client and server implementation
- Captures:
  - Supported operations and objects
  - Supported profiles
  - Supported test cases
  - Supported profile test cases

Claim sheet – Summary Page

KMIP Capability Statement - Summary

Organisation:	Cryptsoft	**Completed by:**	Tim Hudson
Product:	KMIP C Client SDK	**Contact email:**	tjh@cryptsoft.com
Product Version	v1.5.5b	**Contact phone:**	+61731030321
Client/Server:	**Client**	**Date completed:**	20-January-2013
Product GA Date:	v1.5.0a Jun 2011 v1.5.5b Jan 2013		

^Insert N/A if not applicable

KMIP Specification Support	
KMIP 1.0 Operations	100%
KMIP 1.1 Operations	100%
KMIP State	100%
KMIP Object Types	100%
Certificate	100%
Key Format Types	100%
Custom Attribute Types	100%

KMIP Profile Coverage	
KMIP V1.0 Server Profiles	0%
KMIP V1.1 Server Profiles	0%
KMIP V1.1 Client Profiles	100%

Test Case Coverage	
KMIP Version 1.0 Test Cases	100%
KMIP Version 1.1 Test Cases	100%

Profile Test Case Coverage	
Symmetric Key Foundry FIPS Profile	100%
Opaque Managed Object Store Profile	100%
Symmetric Key LifeCycle Profile	100%
Asymmetric Key LifeCycle Profile	100%

Collation Contact: tony.cox@cryptsoft.com

Capability Statement to be completed and returned by **3pm PST Jan 20, 2013**
Interop testing and Server capability reports circulated by **5pm PST Jan 23, 2013**

Claim sheet – KMIP Support

KMIP Capability Statement - Specification

Organisation:	Cryptsoft
Product:	KMIP C Client SDK
Client/Server:	v1.5.5b

KMIP Specification Coverage

KMIP Feature		**Claimed capability**	**Comments**
KMIP 1.0 Operations			
Create	1	Supported	
Create Key Pair	2	Supported	
Register	3	Supported	
Re-key	4	Supported	
Derive Key	5	Supported	
Certify	6	Supported	
Re-certify	7	Supported	
Locate	8	Supported	
Check	9	Supported	
Get	10	Supported	
Get Attributes	11	Supported	
Get Attribute List	12	Supported	
Add Attribute	13	Supported	
Modify Attribute	14	Supported	
Delete Attribute	15	Supported	
Obtain Lease	16	Supported	
Get Usage Allocation	17	Supported	
Activate	18	Supported	
Revoke	19	Supported	
Destroy	20	Supported	
Archive	21	Supported	
Recover	22	Supported	
Validate	23	Supported	
Query	24	Supported	
Cancel	25	Supported	
Poll	26	Supported	
Notify	27	Supported	
Put	28	Supported	
	KMIP 1.0 Operations Total	28	
	KMIP 1.0 Operations % Supported	100.0%	

Claim sheet – Profile Support

KMIP Capability Statement - Profile Support

Organisation:	Cryptsoft
Product:	KMIP C Client SDK
Client/Server:	v1.5.5b

KMIP Profile Coverage

KMIP Profile	Description		Claimed capability	Comments
KMIP V1.0 Server Profiles				
Secret Data Server		1		
Basic Symmetric Key Store and Server		2		
Basic Symmetric Key Foundry and Server		3		
	KMIP V1.0 Server Profiles Total		0	
	KMIP V1.0 Server Profiles % Supported		0.0%	
KMIP V1.1 Server Profiles				
Basic Discover Versions Server Profile		1		
Basic Baseline Server KMIP Profile		2		
Basic Secret Data Server KMIP Profile		3		
Basic Symmetric Key Store and Server KMIP Profile		4		
Basic Symmetric Key Foundry and Server KMIP Profile		5		
Basic Asymmetric Key Store Server KMIP Profile		6		
Basic Asymmetric Key and Certificate Store Server KMIP Profile		7		
Basic Asymmetric Key Foundry and Server KMIP Profile		8		
Basic Certificate Server KMIP Profile		9		
Basic Asymmetric Key Foundry and Certificate Server KMIP Profile		10		
Discover Versions TLS 1.2 Authentication Server Profile		11		
Baseline Server TLS 1.2 Authentication KMIP Profile		12		
Secret Data Server TLS 1.2 Authentication KMIP Profile		13		
Symmetric Key Store and Server TLS 1.2 Authentication KMIP Profile		14		
Symmetric Key Foundry and Server TLS 1.2 Authentication KMIP Profile		15		
Asymmetric Key Store Server TLS 1.2 Authentication KMIP Profile		16		
Asymmetric Key and Certificate Store Server TLS 1.2 Authentication KMIP Profile		17		
Asymmetric Key Foundry and Server TLS 1.2 Authentication KMIP Profile		18		
Certificate Server TLS 1.2 Authentication KMIP Profile		19		
Asymmetric Key Foundry and Certificate Server TLS 1.2 Authentication KMIP Profile		20		
	KMIP V1.1 Server Profiles Total		0	
	KMIP V1.1 Server Profiles % Supported		0.0%	
KMIP V1.1 Client Profiles				
Basic Discover Versions Client KMIP Profile		1	Supported	
Basic Baseline Client KMIP Profile		2	Supported	
Basic Secret Data Client KMIP Profile		3	Supported	
Basic Symmetric Key Store Client KMIP Profile		4	Supported	

Claim sheet – Test Cases

KMIP Capability Statement - Test Cases

Organisation:	Cryptsoft
Product:	KMIP C Client SDK
Client/Server:	v1.5.5b

Test Case Coverage

Test Case ID	Description		Claimed capability	Comments
KMIP Version 1.0 Test Cases				
TC-311-10	3.1.1_ Create / Destroy	1	Supported	
TC-312-10	3.1.2_ Register / Create / Get attributes / Destroy	2	Supported	
TC-313-10	3.1.3_ Create / Locate / Get / Destroy	3	Supported	
TC-314-10	3.1.4_ Dual client use-case, ID Placeholder linked Locate & Get batch	4	Supported	
TC-315-10	3.1.5_ Register / Destroy Secret Data	5	Supported	
TC-32-10	3.2_ Asynchronous Locate	6	Supported	
TC-41-10	4.1_ Revoke scenario	7	Supported	
TC-51-10	5.1_ Get usage allocation scenario	8	Supported	
TC-61-10	6.1_ Import of a Third-party Key	9	Supported	
TC-71-10	7.1_ Unrecognized Message Extension with Criticality Indicator false	10	Supported	
TC-72-10	7.2_ Unrecognized Message Extension with Criticality Indicator true	11	Supported	
TC-81-10	8.1_ Create a Key Pair	12	Supported	
TC-82-10	8.2_ Register Both Halves of a Key Pair	13	Supported	
TC-91-10	9.1_ Create a Key, Re-key	14	Supported	
TC-92-10	9.2_ Existing Key Expired, Re-key with Same lifecycle	15	Supported	
TC-93-10	9.3_ Existing Key Compromised, Re-key with same lifecycle	16	Supported	
TC-94-10	9.4_ Create key, Re-key with new lifecycle	17	Supported	
TC-95-10	9.5_ Obtain Lease for Expired Key	18	Supported	
TC-101-10	10.1_ Create a Key, Archive and Recover it	19	Supported	
TC-111-10	11.1_ Credential, Operation Policy, Destroy Date	20	Supported	
TC-121-10	12.1_ Query, Maximum Response Size	21	Supported	
TC-131-10	13.1_ Asymmetric Register PKCS#1	22	Supported	
TC-132-10	13.2_ Asymmetric Register Certificate	23	Supported	
TC-134-10	13.4_ Asymmetric Register / Certify	24	Supported	
	KMIP Version 1.0 Test Cases Total		24	
	KMIP Version 1.0 Test Cases % Supported		100.0%	

Claim sheet – Profile Test Cases

KMIP Capability Statement - Profile Test Cases

Organisation:	Cryptsoft
Product:	KMIP C Client SDK
Client/Server:	v1.5.5b

Profile Test Case Coverage

Test Case ID	Description		Claimed capability	Comments
Symmetric Key Foundry FIPS Profile				
SKFF-M-1-11	Symmetric Key Foundry-FIPS Mandatory Test Case 1	1	Supported	
SKFF-M-2-11	Symmetric Key Foundry-FIPS Mandatory Test Case 2	2	Supported	
SKFF-M-3-11	Symmetric Key Foundry-FIPS Mandatory Test Case 3	3	Supported	
SKFF-M-4-11	Symmetric Key Foundry-FIPS Mandatory Test Case 4	4	Supported	
SKFF-M-5-11	Symmetric Key Foundry-FIPS Mandatory Test Case 5	5	Supported	
SKFF-M-6-11	Symmetric Key Foundry-FIPS Mandatory Test Case 6	6	Supported	
SKFF-M-7-11	Symmetric Key Foundry-FIPS Mandatory Test Case 7	7	Supported	
SKFF-M-8-11	Symmetric Key Foundry-FIPS Mandatory Test Case 8	8	Supported	
SKFF-M-9-11	Symmetric Key Foundry-FIPS Mandatory Test Case 9	9	Supported	
SKFF-M-10-11	Symmetric Key Foundry-FIPS Mandatory Test Case 10	10	Supported	
SKFF-M-11-11	Symmetric Key Foundry-FIPS Mandatory Test Case 11	11	Supported	
SKFF-M-12-11	Symmetric Key Foundry-FIPS Mandatory Test Case 12	12	Supported	
SKFF-O-1-11	Symmetric Key Foundry-FIPS Optional Test Case 1	13	Supported	
SKFF-O-2-11	Symmetric Key Foundry-FIPS Optional Test Case 2	14	Supported	
SKFF-O-3-11	Symmetric Key Foundry-FIPS Optional Test Case 3	15	Supported	
SKFF-O-4-11	Symmetric Key Foundry-FIPS Optional Test Case 4	16	Supported	
SKFF-O-5-11	Symmetric Key Foundry-FIPS Optional Test Case 5	17	Supported	
SKFF-O-6-11	Symmetric Key Foundry-FIPS Optional Test Case 6	18	Supported	
	Symmetric Key Foundry FIPS Profile Total		18	
	Symmetric Key Foundry FIPS Profile % Supported		100.0%	
Opaque Managed Object Store Profile				
OMOS-M-1-11	Opaque Managed Object Store Mandatory Test Case 1	1	Supported	
OMOS-O-1-11	Opaque Managed Object Store Optional Test Case 1	2	Supported	
	Opaque Managed Object Store Profile Total		2	
	Opaque Managed Object Store Profile % Supported		100.0%	

Claim collation

- Claims are collected from all vendors and checked
  - Blank cells are considered “unsupported”
- Cross-Implementation test sheets are constructed
  - Tests are available only for tests cases supported by both the client and the vendor
- Test sheets are sent to each “vendor-pair”

Claim collation - Test sheet

KMIP Capability Statement - Test Cases

Client		Server	
Organisation:	Cryptsoft	**Organisation:**	Cryptsoft
Product:	KMIP C Client SDK	**Product:**	KMIP C Server SDK
Client/Server:	v1.5.5b	**Client/Server:**	v1.5.9c

Test Case Coverage

Test Case ID	Description		Client Claimed	Server Claimed	Valid Test	Client Test	Server Verification	Comments
TC-91-11	9.1_ Create a Key, Re-key	14	Supported	Supported	Y			
TC-92-11	9.2_ Existing Key Expired, Re-key with Same lifecycle	15	Supported	Supported	Y			
TC-93-11	9.3_ Existing Key Compromised, Re-key with same lifecycle	16	Supported	Supported	Y			
TC-94-11	9.4_ Create key, Re-key with new lifecycle	17	Supported	Supported	Y			
TC-95-11	9.5_ Obtain Lease for Expired Key	18	Supported	Supported	Y			
TC-101-11	10.1_ Create a Key, Archive and Recover it	19	Supported	Supported	Y			
TC-111-11	11.1_ Credential, Operation Policy, Destroy Date	20	Supported	Supported	Y			
TC-112-11	11.2_ Device Credential, Operation Policy, Destroy Date	21	Supported	Supported	Y			
TC-121-11	12.1_ Query, Maximum Response Size	22	Supported	Supported	Y			
TC-122-11	12.2_ Query Vendor Extensions	23	Supported	Supported	Y			
TC-131-11	13.1_ Asymmetric Register PKCS#1	24	Supported	Supported	Y			
TC-132-11	13.2_ Asymmetric Register Certificate	25	Supported	Supported	Y			
TC-133-11	13.3_ Asymmetric Create / Re-Key	26	Supported	Supported	Y			
TC-134-11	13.4_ Asymmetric Register / Certify	27	Supported	Supported	Y			
TC-141-11	14.1_ Key Wrapping using AES Key Wrap and No Encoding	28	Supported	Supported	Y			
TC-142-11	14.2_ Key Wrapping using AES Key Wrap with Attributes	29	Supported	Supported	Y			
TC-151-11	15.1_ Locate a Fresh Object from the Default Group	30	Supported	Supported	Y			
TC-152-11	15.2_ Client-side Group Management	31	Supported	Supported	Y			
TC-153-11	15.3_ Default Object Group Member	32	Supported	Unsupported	N			
TC-161-11	16.1_ Discover Versions	33	Supported	Supported	Y			
TC-171-11	17.1_ Handling of Attributes and Attribute Index Values	34	Supported	Supported	Y			
TC-181-11	18.1_ Digests of Symmetric Keys	35	Supported	Supported	Y			
TC-182-11	18.2_ Digests of RSA Private Keys	36	Supported	Supported	Y			
		Totals	36	35	35	0	0	
		% of full list	100.00%	97.22%	97.22%	0.00%	0.00%	

Testing

- Client operators conduct tests against each server
- Results are reported as either “Passed” or “Failed”
- Both the client and server logs are kept in case of any dispute that may arise for a given test case
- Test results are sent to the Server operator on completion

Verification

- Server operator checks each client test entry and marks each as “Verified” or “Contested”
- Server operator returns verified test sheets to the respective client operator and any disputes are resolved.
- If any disputes remain unresolved, the issue is escalated for resolution in the interop group, then the TC if required.

Verification

KMIP Capability Statement - Test Cases

Client	Server
	Organisation:
	Product:
	Client/Server:

Test Case Coverage

Description		Client Claimed	Server Claimed	Valid Test	Client Test	Server Verification	Comments
8.1_ Create a Key Pair	12	Supported	Supported	Y	Passed	Verified	
8.2_ Register Both Halves of a Key Pair	13	Supported	Supported	Y	Passed	Verified	
9.1_ Create a Key, Re-key	14	Supported	Supported	Y	Passed	Verified	
9.2_ Existing Key Expired, Re-key with Same lifecycle	15	Supported	Supported	Y	Passed	Contested	
9.3_ Existing Key Compromised, Re-key with same lifecycle	16	Supported	Supported	Y	Passed	Verified	
9.4_ Create key, Re-key with new lifecycle	17	Supported	Supported	Y	Passed	Verified	
9.5_ Obtain Lease for Expired Key	18	Supported	Supported	Y	Passed	Verified	
10.1_ Create a Key, Archive and Recover it	19	Unsupported	Supported	N			
11.1_ Credential, Operation Policy, Destroy Date	20	Supported	Supported	Y	Passed	Verified	
11.2_ Device Credential, Operation Policy, Destroy Date	21	Supported	Supported	Y	Passed	Verified	
12.1_ Query, Maximum Response Size	22	Supported	Supported	Y	Passed	Verified	
12.2_ Query Vendor Extensions	23	Supported	Supported	Y	Passed	Verified	
13.1_ Asymmetric Register PKCS#1	24	Supported	Supported	Y	Passed	Verified	
13.2_ Asymmetric Register Certificate	25	Supported	Supported	Y	Passed	Verified	
13.3_ Asymmetric Create / Re-Key	26	Supported	Supported	Y	Passed	Verified	
13.4_ Asymmetric Register / Certify	27	Unsupported	Supported	N			
14.1_ Key Wrapping using AES Key Wrap and No Encoding	28	Supported	Supported	Y	Passed	Verified	
14.2_ Key Wrapping using AES Key Wrap with Attributes	29	Unsupported	Supported	N			
15.1_ Locate a Fresh Object from the Default Group	30	Supported	Supported	Y	Passed	Verified	
15.2_ Client-side Group Management	31	Supported	Supported	Y	Passed	Verified	
15.3_ Default Object Group Member	32	Supported	Unsupported	N			
16.1_ Discover Versions	33	Supported	Supported	Y	Passed	Verified	
17.1_ Handling of Attributes and Attribute Index Values	34	Supported	Supported	Y	Passed	Verified	
18.1_ Digests of Symmetric Keys	35	Supported	Supported	Y	Passed	Verified	
18.2_ Digests of RSA Private Keys	36	Supported	Supported	Y	Passed	Verified	

Results

- Test sheets are collected from all client operators and fed into a master file.
- Test result file is circulated to interop participants to resolve any outstanding issues or gaps
- Once all results are agreed:
  - The claim sheets are analysed and graphed
  - The test results are analysed and graphed

Claim Results – Master File

January 2013 Formal Interop - Implementation claims								
		Client Claims						
		Client A	Client B	Client C	Client D	Client E	Client F	Client G
KMIP Specification Support								
	Create	Supported	Supported	Supported	Supported	Supported	Supported	Supported
	Create Key Pair	Supported	Supported	Supported	Supported	Supported	Supported	Supported
	Register	Supported	Supported	Supported	Supported	Supported	Supported	Supported
	Re-key	Supported	Supported	Supported	Supported	Supported	Supported	Supported
	Derive Key	Supported	Supported	Supported	Supported	Supported	Supported	Supported
	Certify	Supported	Supported	Supported	Supported	Supported	Supported	Supported
	Re-certify	Supported	Supported	Supported	Supported	Unsupported	Supported	Supported
	Locate	Supported	Supported	Supported	Supported	Supported	Supported	Supported

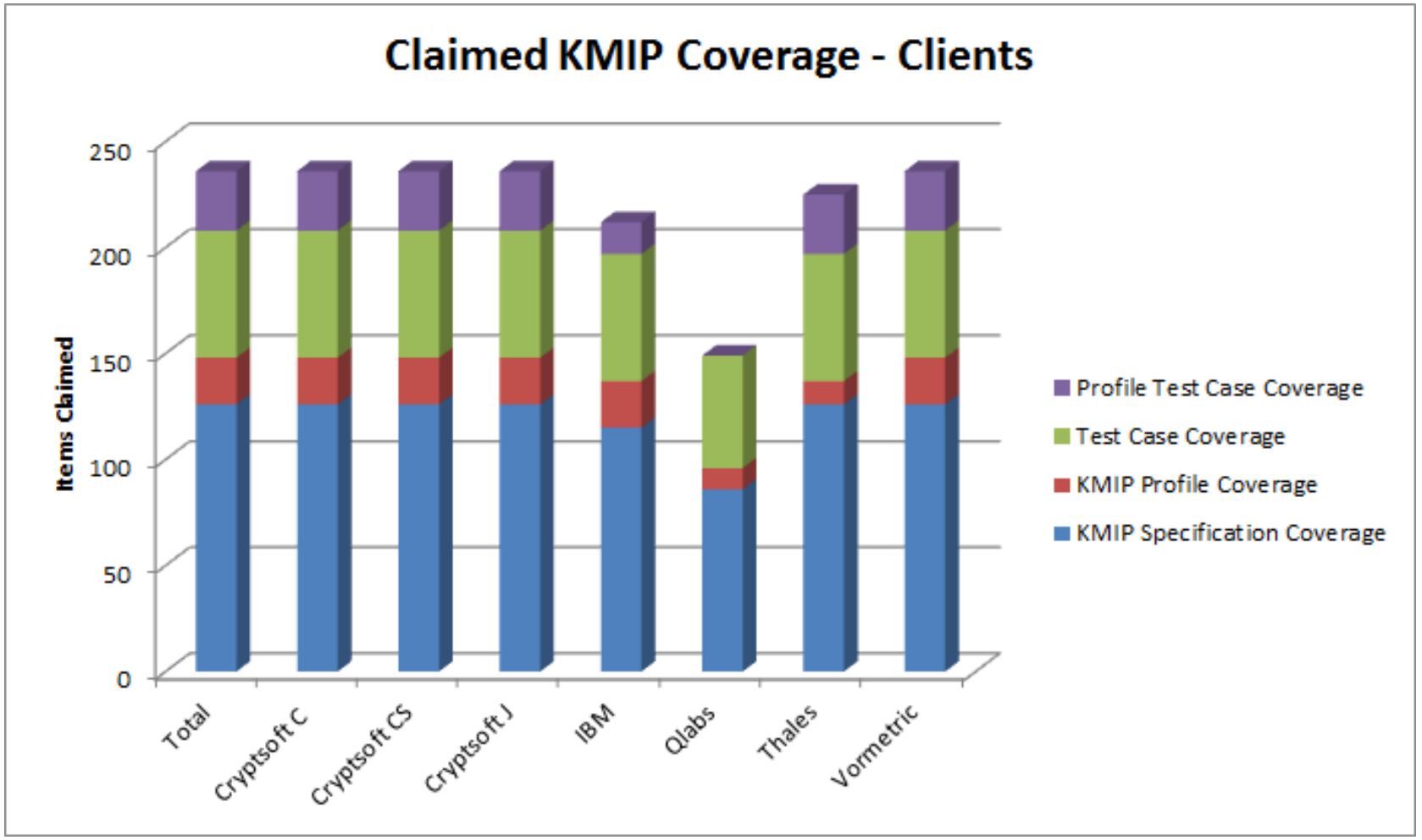
January 2013 Formal Interop - Implementation claims										
		Server Claims								
		Server A	Server B	Server C	Server D	Server E	Server F	Server G	Server H	Server I
KMIP Specification Support										
	Create	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported
	Create Key Pair	Supported	Supported	Unsupported	Supported	Supported	Supported	Supported	Unsupported	Supported
	Register	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported
	Re-key	Supported	Supported	Supported	Supported	Unsupported	Supported	Supported	Supported	Supported
	Derive Key	Unsupported	Supported	Unsupported	Unsupported	Unsupported	Supported	Unsupported	Unsupported	Unsupported
	Certify	Supported	Supported	Unsupported	Supported	Unsupported	Supported	Supported	Unsupported	Supported
	Re-certify	Supported	Supported	Unsupported	Supported	Unsupported	Unsupported	Supported	Unsupported	Supported
	Locate	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported
	Check	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported
	Get	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported
	Get Attributes	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported
	Get Attribute List	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported
	Add Attribute	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported
perations	Modify Attribute	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported

Test Results – Master File

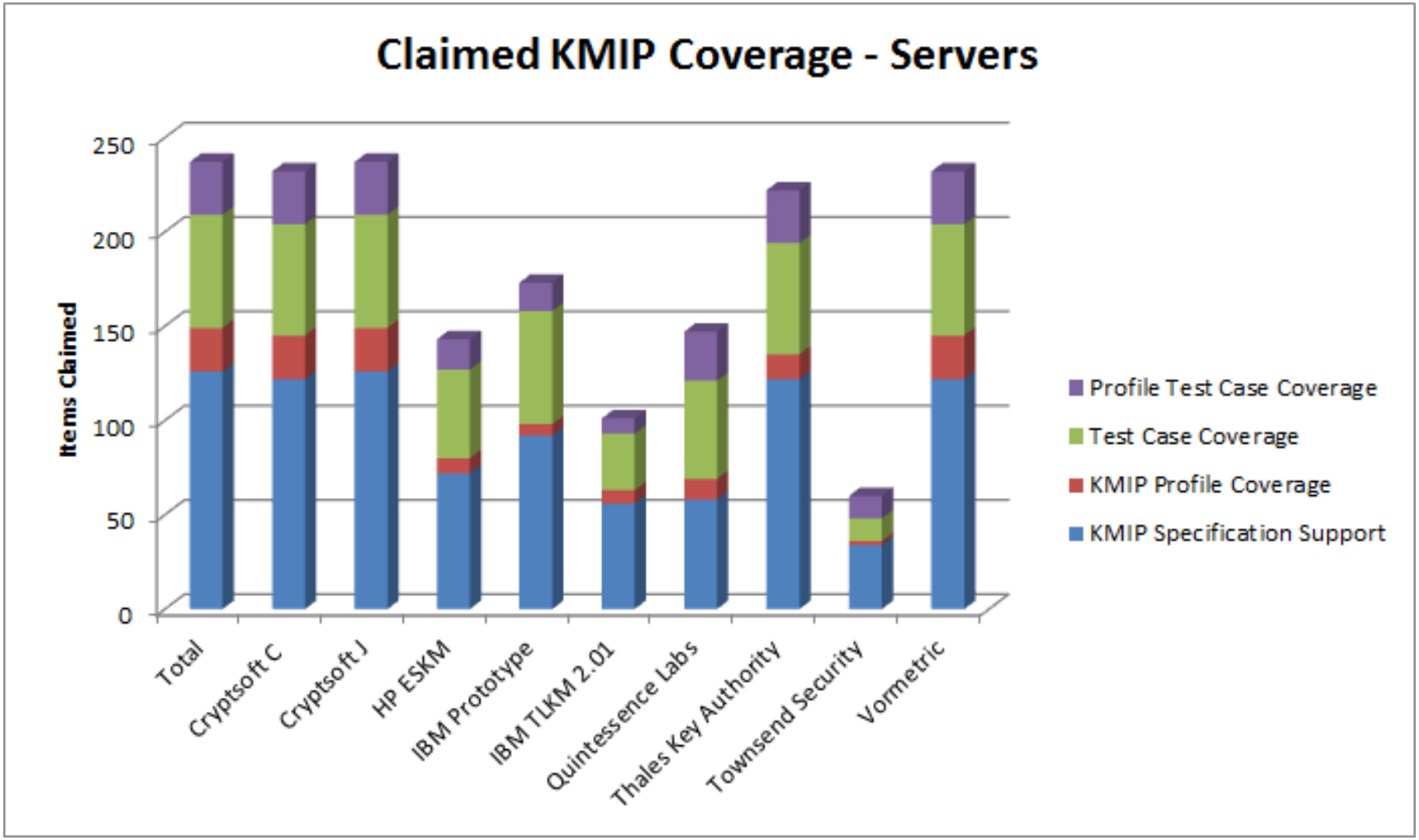
Server Testing Results

KMIP Version 1.0 Test Cases	Count	SERVER-C				SERVER-D							SERVER-E							SERVER-F							SERVER-G							SERVER-H						
		CLIENT-E	CLIENT-F	CLIENT-G	Summary	CLIENT-A	CLIENT-C	CLIENT-B	CLIENT-E	CLIENT-F	CLIENT-G	Summary	CLIENT-A	CLIENT-C	CLIENT-B	CLIENT-D	CLIENT-F	CLIENT-G	Summary	CLIENT-A	CLIENT-C	CLIENT-B	CLIENT-D	CLIENT-E	CLIENT-G	Summary	CLIENT-A	CLIENT-C	CLIENT-B	CLIENT-D	CLIENT-E	CLIENT-F	CLIENT-G	Summary	CLIENT-A	CLIENT-C	CLIENT-B	CLIENT-D	CLIENT-E	CLIENT-F	Summary
SKFF-M-3-11		-		P-V	P	P-V	P-V	P-V	-		P-V	P	P-V	P-V	P-V	P-V	P-V		P	P-V	P-V	P-V				P	P-V	P-V	P-V	P-V	-	P-C	P-V		P-V	P-V	P-V	P-V		P-V	P
SKFF-M-4-11		-		P-V	P	P-V	P-V	P-V	-		P-V	P	P-V	P-V	P-V	P-V	P-V		P	P-V	P-V	P-V				P	-	-	-	-	-	-	-	U	P-V	P-V	P-V	P-V		P-V	P
SKFF-M-5-11		-		P-V	P	P-V	P-V	P-V	-		P-V	P	P-V	P-V	P-V	P-V	P-V		P	P-V	P-V	P-V				P	P-V	P-V	P-V	P-V	-	P-C	P-V		P-V	P-V	P-V	P-V		P-V	P
SKFF-M-6-11		-		P-V	P	P-V	P-V	P-V	-		P-V	P	P-V	P-V	P-V	P-V	P-V		P	P-V	P-V	P-V				P	P-V	P-V	P-V	P-V	-	P-C	P-V		P-V	P-V	P-V	P-V		P-V	P
SKFF-M-7-11		-		P-V	P	P-V	P-V	P-V	-		P-V	P	P-V	P-V	P-V	P-V	P-V		P	P-V	P-V	P-V				P	P-V	P-V	P-V	P-V	-	P-C	P-V		P-V	P-V	P-V	P-V		P-V	P
SKFF-M-8-11		-		P-V	P	P-V	P-V	P-V	-		P-V	P	P-V	P-V	P-V	P-V	P-V		P	P-V	P-V	P-V				P	-	-	-	-	-	-	-	U	P-V	P-V	P-V	P-V		P-V	P
SKFF-M-9-11		-		P-V	P	-	-	-	-		-	U	P-V	F-C	F-C	P-V	P-V			P-V	P-V	P-V				P	P-V	P-V	P-V	P-V	-	P-C	P-V		P-V	P-V	P-V	P-V		P-V	P
SKFF-M-10-11		-		P-V	P	-	-	-	-		-	U	P-V	F-C	F-C	P-V	P-V			P-V	P-V	P-V				P	P-V	P-V	P-V	P-V	-	P-C	P-V		P-V	P-V	P-V	P-V		P-V	P
SKFF-M-11-11		-		P-V	P	-	-	-	-		-	U	P-V	F-C	F-C	P-V	P-V			P-V	P-V	P-V				P	P-V	P-V	P-V	P-V	-	P-C	P-V		P-V	P-V	P-V	P-V		P-V	P
SKFF-M-12-11		-		P-V	P	-	-	-	-		-	U	P-V	F-C	F-C	P-V	P-V			P-V	P-V	P-V				P	-	-	-	-	-	-	-	U	P-V	P-V	P-V	P-V		P-V	P
SKFF-O-1-11		-		-	U	-	-	-	-		-	U	P-V	P-V	P-V	-	P-V		P	P-V	P-V	P-V				P	-	-	-	-	-	-	-	U	P-V	P-V	P-V	-		P-V	P
SKFF-O-2-11		-		-	U	-	-	-	-		-	U	P-V	P-V	P-V	-	P-V		P	P-V	P-V	P-V				P	-	-	-	-	-	-	-	U	P-V	P-V	P-V	-		P-V	P
SKFF-O-3-11		-		-	U	-	-	-	-		-	U	P-V	F-C	F-C	-	P-V			P-V	P-V	P-V				P	-	-	-	-	-	-	-	U	P-V	P-V	P-V	-		P-V	P
SKFF-O-4-11		-		P-V	P	-	-	-	-		-	U	P-V	P-V	P-V	P-V	P-V		P	P-V	P-V	P-V				P	-	-	-	-	-	-	-	U	P-V	P-V	P-V	P-V		P-V	P
SKFF-O-5-11		-		P-V	P	-	-	-	-		-	U	P-V	P-V	P-V	P-V	P-V		P	P-V	P-V	P-V				P	-	-	-	-	-	-	-	U	P-V	P-V	P-V	P-V		P-V	P
SKFF-O-6-11		-		P-V	P	-	-	-	-		-	U	P-V	F-C	F-C	P-V	P-V			P-V	P-V	P-V				P	-	-	-	-	-	-	-	U	P-V	P-V	P-V	P-V		P-V	P
Total	18				72%							33%							56%							89%								0%							89%
Opaque Managed Object Store Pro																																									
OMOS-M-1-11		-		-	U	-	-	-	-		-	U	P-V	P-V	P-V	-	P-V		P	P-V	P-V	P-V				P	-	-	-	-	-	-	-	U	P-V	P-V	P-V	-		P-V	P
OMOS-O-1-11		-		-	U	-	-	-	-		-	U	P-V	P-V	P-V	-	P-V		P	P-V	P-V	P-V				P	-	-	-	-	-	-	-	U	P-V	P-V	P-V	-		P-V	P
Total	2				0%							0%							100%							100%								0%							100%
Symmetric Key LifeCycle Profile																																									
SKLC-M-1-11		-		-	U	-	-	-	-		-	U	P-V	P-V	P-V	-	P-V		P	P-V	P-V	P-V				P	P-V	P-V	P-V	-	-	P-C	P-V		P-V	P-V	P-V	-		P-V	P
SKLC-M-2-11		-		-	U	-	-	-	-		-	U	P-V	P-V	P-V	-	P-V		P	P-V	P-V	P-V				P	P-V	P-V	P-V	-	-	P-C	P-V		P-V	P-V	P-V	-		P-V	P

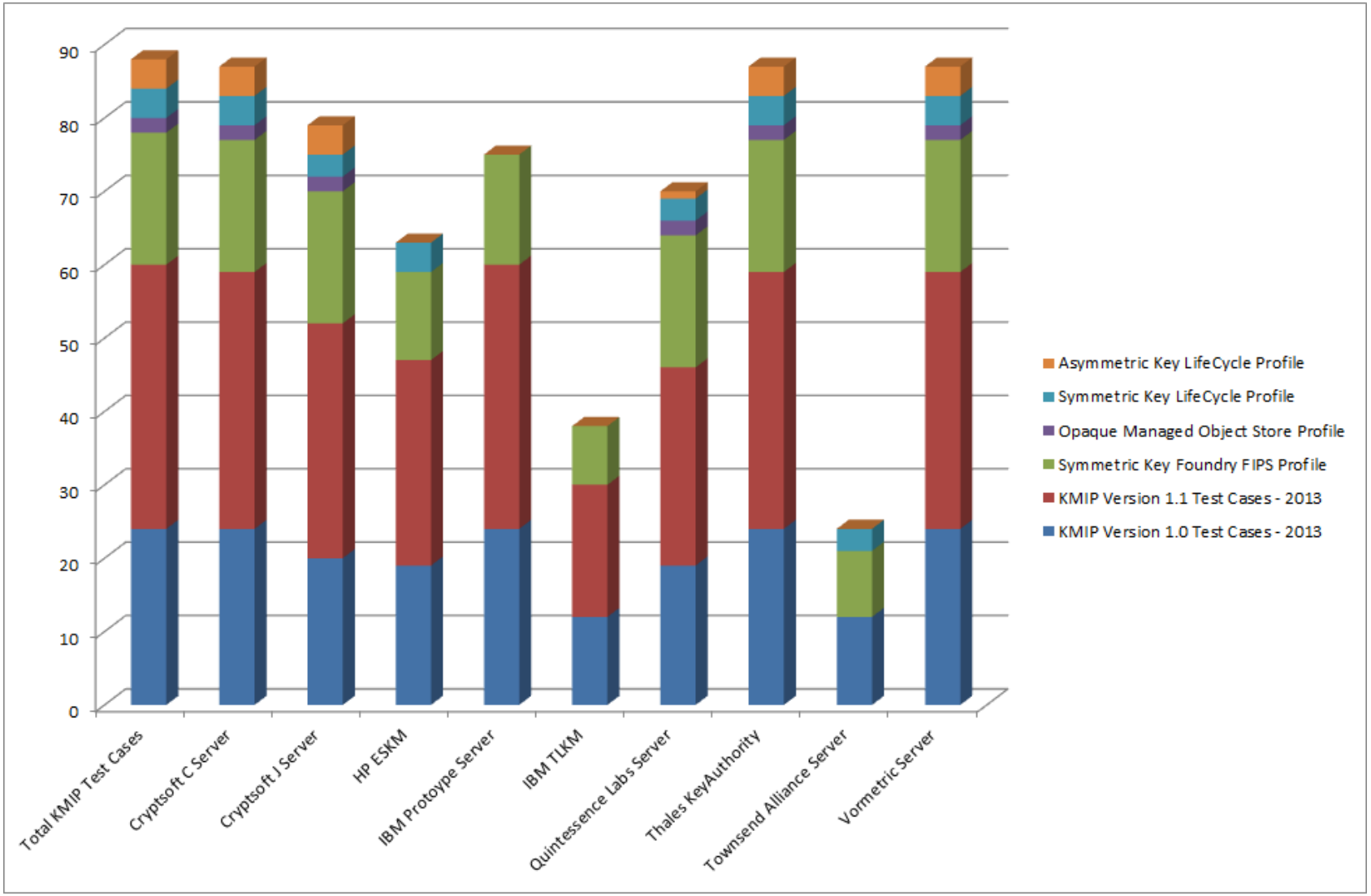
Claim Results - Clients



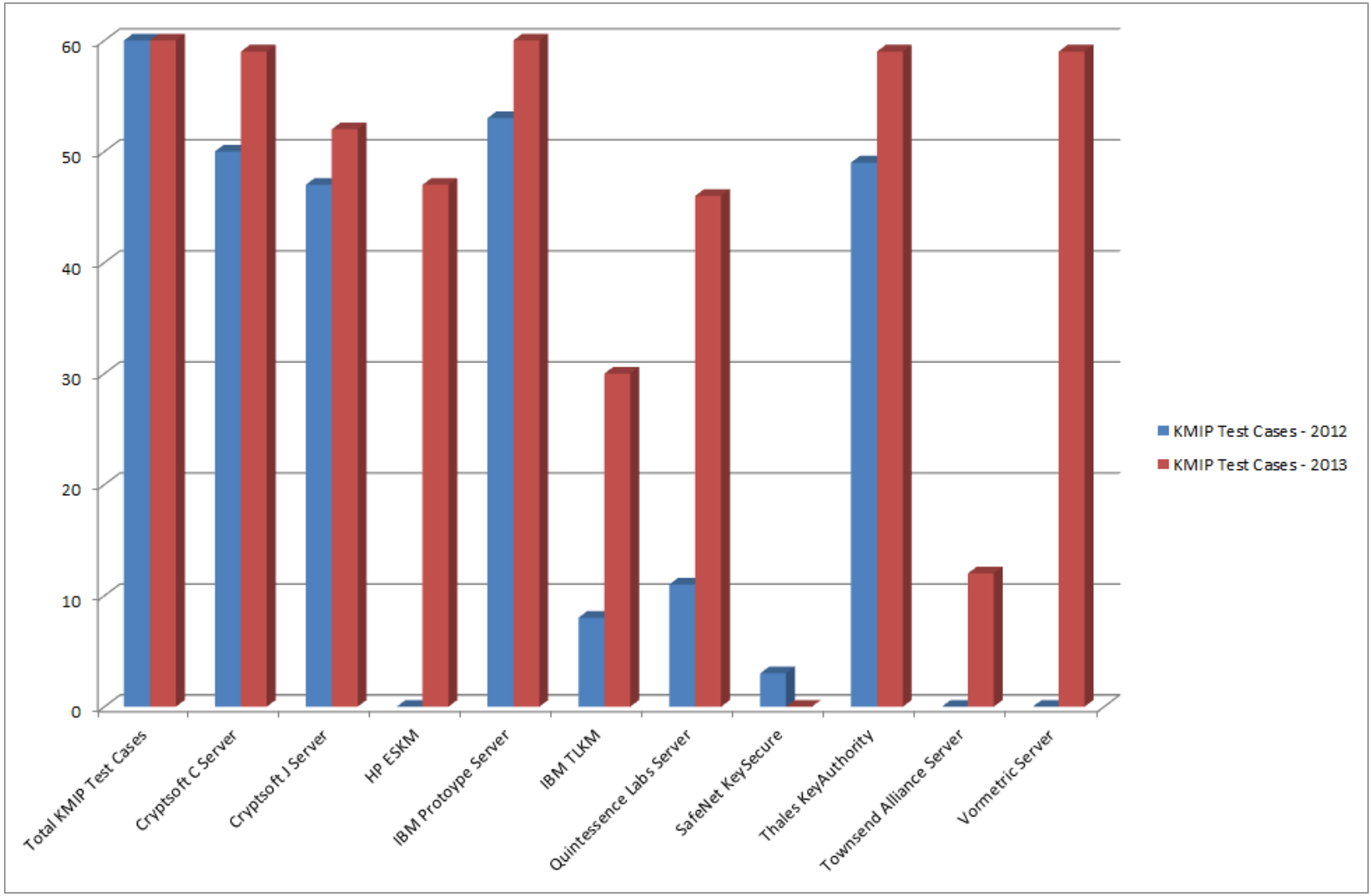
Claim Results - Servers



Test Results - Overall

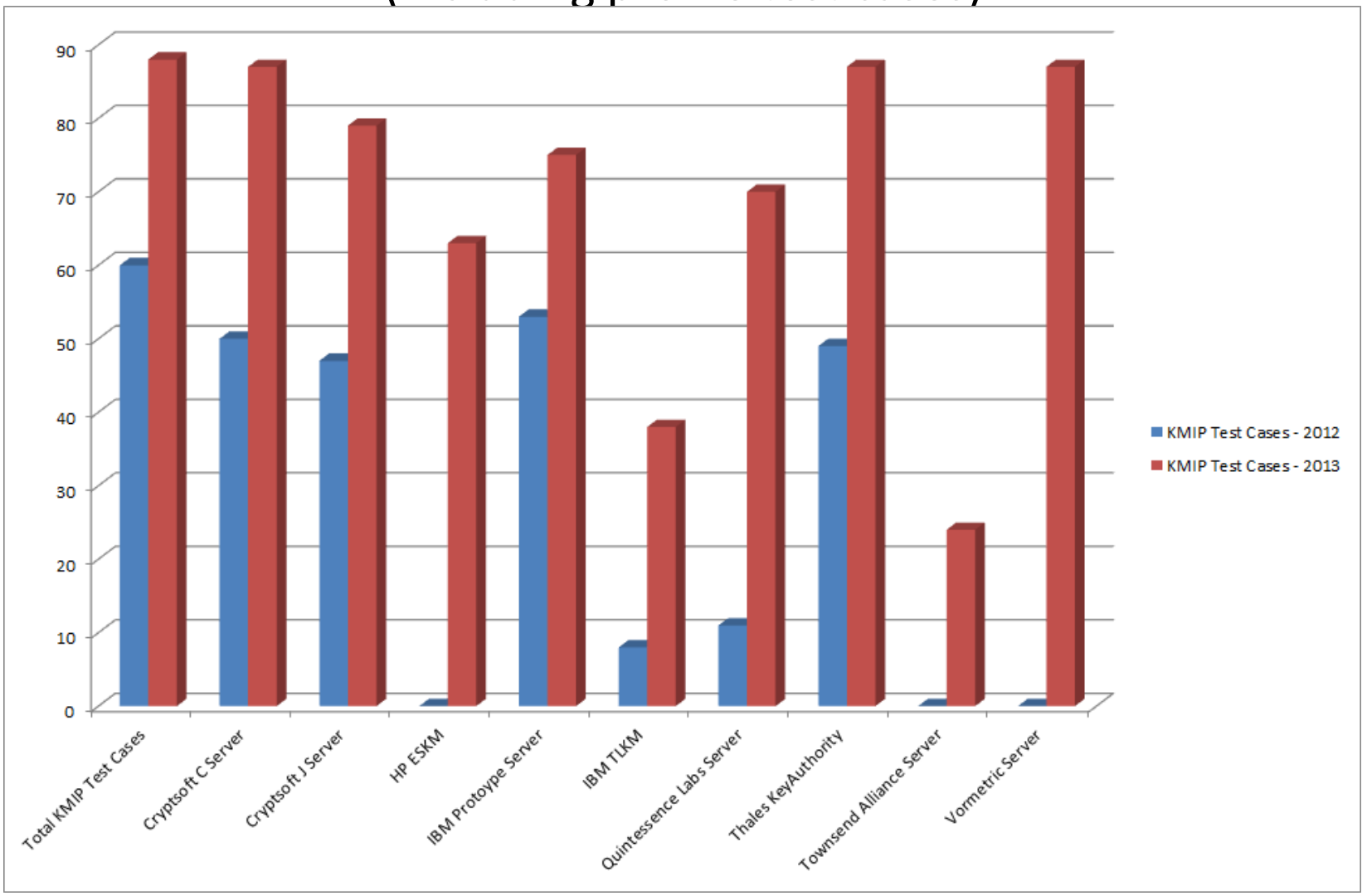


Progression from 2012 to 2013



Progression from 2012 to 2013

(including profile test cases)



Test Results – Profile Test Cases